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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/945,512	08/30/2001	Leonard Forbes	1303.027US1	2652

7590

12/20/2002

Schwegman, Lundberg, Woessner & Kluth, P.A.
Attn: Edward J. Brooks, III
P.O. Box 2938
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EXAMINER

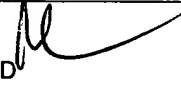
BOOTH, RICHARD A.

ART UNIT PAPER NUMBER

2812

DATE MAILED: 12/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/945,512	Applicant(s) FORBES, LEONARD 	
	Examiner Richard A. Booth	Art Unit 2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-65 is/are pending in the application.
- 4a) Of the above claim(s) 2,5,10,15-27,29,34,46,47,49,64 and 65 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6,8,9,11,13,14,28,30,32,33,35-45,48,50-52,54-57 and 59-65 is/are rejected.
- 7) ☒ Claim(s) 7,12,31,53 and 58 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>6</u> . | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of the embodiment directed to claims 1, 3-4, 6-9, 11-14, 28, 30-33, 35-45, 48, and 50-63 in Paper No. 5 is acknowledged.

Specification

The disclosure is objected to because of the following informalities: some of the related applications mentioned in the specification appear to be wrong since they are related to art that is non-analogous to the claimed invention. Proofreading or correction is required to make sure that the related application numbers are correct.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-4, 8-9, 13-14, 28, 32-33, 35-45, 48, 50-51, 54-56, 59-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forbes et al., U.S. Patent 5,991,225 in view of Bui, U.S. Patent 6,163,049.

Forbes et al. shows the invention substantially as claimed including an in-service programmable logic array comprising: a number of logic cells arranged in rows and

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columns that are interconnected to produce a number of logical outputs such that the in service programmable array implements a logical function, wherein each of the logic cells includes: a first source/drain 310 and a second source/drain 320 separated by a channel or body region 320; a floating gate 232 opposing the channel region and separated therefrom by a gate oxide; a control gate 238 opposing the floating gate and wherein the control gate is separated from the floating gate by an insulator.

Furthermore, Forbes et al. discloses an embodiment on a SOI substrate where the source lines are formed in the substrate (see figs. 5A-16 and col. 9-line 6 to col. 17-line 11).

Forbes et al. fails to expressly disclose separating the floating gate and the control gate by an insulator that is a low tunnel barrier intergate insulator such as tantalum oxide. Bui discloses forming an intergate insulator comprising tantalum oxide between a floating gate 500 and a control gate 700 (see figs. 2-3 and col. 4-line 17 to col. 5-line 45). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the primary reference of Forbes et al. so as to include a low tunnel barrier intergate insulator such as tantalum oxide between the floating gate and the control gate because this allows layers with smaller thicknesses while maintaining good device characteristics because of the high dielectric constant.

Claims 6, 11, 30, 52, and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forbes et al., U.S. Patent 5,991,225 in view of Bui, U.S. Patent

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6,163,049 as applied to claims 1, 3-4, 8-9, 13-14, 28, 30, 32-33, 35-45, 48, 50-51, 54-56, 59-65 above, and further in view of Kapoor, U.S. Patent 5,498,558.

Forbes et al. and Bui are applied as above but fail to expressly disclose where the floating gate has a metal layer in contact with the low tunnel barrier intergate insulator layer. Kapoor discloses forming a metal silicide layer 36a contacting an intergate insulator layer (see fig. 9 and col. 3-line 31 to col. 7-line 15). In view of this disclosure, it would have been obvious to modify the device of Forbes et al. modified by Bui so as to include a metal containing film at the point where the floating gate contacts the intergate insulator because this forms a floating gate of high conductivity with excellent storage potential.

Allowable Subject Matter

Claims 7, 12, 31, 53, and 58 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art, either singly or in combination, fails to anticipate the combination of the following steps: a polysilicon floating gate having a metal layer formed thereon in contact with the low tunnel barrier intergate insulator and a polysilicon control gate having a metal layer formed thereon in contact with the low tunnel barrier intergate insulator, as required by the aforementioned claims.

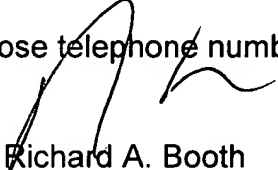
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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard A. Booth whose telephone number is 308-3446. The examiner can normally be reached on Monday-Thursday from 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on 308-3325. The fax phone numbers for the organization where this application or proceeding is assigned are 308-7724 for regular communications and 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-1782.



Richard A. Booth
Primary Examiner
Art Unit 2812

December 15, 2002